Space Weather Forecast

Issued on Tuesday, 02 November 2021 at 00:30 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of further moderate-class flares. Slight chance of G1/Minor geomagnetic storm intervals throughout the forecast period.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: There are three active sunspot regions on the visible disc. A complex region in the southwest quadrant has been responsible for producing a moderate-class and common-class flare over the last 24 hours, both with potentially earth directed coronal mass ejections (CMEs), although the second of these is awaiting analysis. A region close to the centre of the northern hemisphere is also complex, but has not produced any recent significant flares. There is a further simple and benign region close to the northeast limb.

Solar Wind / Geomagnetic Activity: Solar wind parameters, after indicating a declining trend following a previous CME arrival appeared to indicate a further CME arrival late in the UTC day on 01 November. Solar wind speed has been showing a steady increase, with total magnetic field strength increasing to moderate levels from previously weak values. The important north-south component varied moderately after the possible CME arrival. Resultant geomagnetic activity was mainly Quiet, but became Unsettled by the end of the 24 hour period.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained slightly elevated but below minor storm levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to remain mainly low through the next four days, but with a continuing risk of moderate-class flares from the two most complex regions.

Solar Wind / Geomagnetic Activity: A possible recent CME arrival may lead to elevated solar wind speeds on day 1, with a current upward trend. A coronal hole fast wind is then forecast to connect with the earth on day 2, perhaps reaching speeds of 500km/s. Further CMEs may glance the earth on days 3 and 4, although these are considered to be low probability. Unsettled geomagnetic conditions are forecast to predominate through the next four days. There is also a slight chance of Active or G1/Minor Storm intervals through the forecast period, due either to the onset of the coronal hole fast wind, CME effects, or combinations of these events.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be below storm level with a general decrease towards background levels.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	20	20	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	20	20	20
Very Active	R3 to R5 X	No	5	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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